

**Appl. No.** **10/687,086**  
**Filed** : **October 16, 2003**

## **REMARKS**

The April 7, 2005 Office Action was based upon pending Claims 1-10 and 23-33. The amendment amends Claim 23. Thus, after entry of this amendment, Claims 1-10 and 23-33 are pending and presented for further consideration.

In the April 7, 2005 Office Action, the Examiner rejected Claims 1-10 and 23-33. In particular, the Examiner objected to Claims 23-33 because of informalities. Further, the Examiner rejected Claims 1-10 and 23-33 under 35 U.S.C. 103(a) as being obvious over European patent No. 854505 A2 to Lu et al. ("the Lu patent") in view of U.S. Patent No. 5,364,803 to Lur et al. ("the Lur patent").

Reconsideration of the pending claims, as amended, is therefore respectfully requested.

## **OBJECTION TO CLAIMS 23-33**

The Examiner objected to Claims 23-33 because of informalities. In response, Applicants have amended Claim 23 to delete "forming" and "annealing".

The Examiner further objected to Claim 23 as reciting two mutually contradictory subject matters. In response, Applicants have amended Claim 23 to delete the phrase "wherein annealing the conductive layer causes at least a portion of the fluorine atoms or ions to diffuse from the conductive layer to the dielectric layer".

Claims 24-33, which depend from Claim 23, are believed to be patentable for the same reasons articulated above with respect to Claim 23, and because of the additional features recited therein.

## **REJECTION OF CLAIMS 1-10 AND 23-33 UNDER 35 U.S.C. §103(a)**

The Examiner rejected Claims 1-10 and 23-33 under 35 U.S.C. 103 (a) as being obvious over Lu in view of Lur.

### **Claims 10 and 23**

Lu appears to teach a titanium boronitride layer to prevent a reaction between the tungsten and the polysilicon in a gate structure. Lu further appears to teach a titanium boronitride layer as an adhesion promoter in a tungsten-based gate structure.

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See page 4 lines 32-37. Lu does **not** teach fluorine incorporation into the conductive layer. Further, Lu does **not** teach using a titanium boronitride layer to inhibit the diffusion of fluorine atoms or ions from the conductive layer into the dielectric layer.

Lur also does **not** teach the use of a titanium boronitride layer to inhibit the diffusion of fluorine atoms or ions from the conductive layer into the dielectric layer. Indeed, Lur does not mention titanium boronitride at all.

In contrast, in an embodiment of the invention, a titanium boronitride barrier layer inhibits the diffusion of fluorine atoms or ions from the conductive layer into the dielectric layer.

The Lu reference does not teach or suggest fluorine atoms or ions in the conductive layer, let alone a titanium boronitride barrier layer to inhibit the diffusion of fluorine atoms or ions from the conductive layer into the dielectric layer. The Lur reference does not teach or suggest a titanium boronitride layer. Thus, there is no suggestion or motivation to combine the Lu reference with the Lur reference.

Because the references cited by the Examiner do not disclose, teach or suggest an integrated circuit structure comprising a conductive layer having at least some fluorine atoms or ions therein, and a titanium boronitride barrier layer inhibiting diffusion of the fluorine atoms or ions from the conductive layer into a gate oxide layer, Applicant asserts that Claims 10 and 23 are not obvious in view of the Lu and Lur. Applicant therefore respectfully submits that Claims 10 and 23 are patentably distinguished over the cited references and Applicant respectfully requests allowance of Claims 10 and 23.

### **Claims 2-10 and 24-33**

Claims 2-10 and 24-33, which depend from Claims 1 and 23, respectively, are believed to be patentable for the same reasons articulated above with respect to Claims 1 and 23, respectively, and because of the additional features recited therein.

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## CONCLUSION

Applicants have endeavored to address all of the Examiner's concerns as expressed in the Outstanding Office Action. In light of the above remarks, reconsideration and withdrawal of the outstanding rejections is specifically requested.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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